

NON-PUBLIC?: N
ACCESSION #: 9004230336
LICENSEE EVENT REPORT (LER)

FACILITY NAME: RIVER BEND STATION PAGE: 1 OF 3

DOCKET NUMBER: 05000458

TITLE: Reactor Scram due to Main Turbine Generator Loss of Field Caused
by Field Relay Malfunction
EVENT DATE: 03/15/90 LER #: 90-008-00 REPORT DATE: 04/16/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 042

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: L. A. England, Director - Nuclear Licensing

TELEPHONE: (504) 381-4145

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: EL COMPONENT: 40 MANUFACTURER: W120
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 2140 hours on 3/15/90 with the unit at 42 percent power (Operational Condition 1) the main turbine generator tripped, resulting in a reactor scram. The generator was tripped by protective relay operation due to a loss of field. This resulted in trip signals being sent to main generator protection breakers at the 230 KV switchyard.

GSU's investigation revealed a malfunction of the zone 1 loss of field relay (40G KLF). This relay was reworked and returned to service. Procedures have been upgraded to include state of the art three-phase testing methods and to clearly identify those conditions that initiate a

generator trip. The reactor scram placed the unit in a safe shutdown condition. Since all safety systems functioned as designed, there was no

impact on the safe operation of the plant or to the health and safety of the public as a result of this event.

END OF ABSTRACT

TEXT PAGE 2 OF 3

REPORTED CONDITION

At 2140 hours on 3/15/90 with the unit at 42 percent power (Operational Condition 1) the main turbine generator (*TG*) tripped, resulting in a reactor scram. The generator was tripped by protective relay operation (*40*) due to a loss of field. This resulted in trip signals being sent to main generator protection breakers at the 230 KV switchyard.

Immediately following the generator trip the reactor scram placed the unit in a safe shutdown condition. Since this event resulted in the actuation of the reactor protection system (RPS), it is reportable pursuant to 10CFR50.73(a)(2)(iv).

INVESTIGATION

The investigation that followed the event revealed the trip was caused by generator loss of field relay (Westinghouse Type KLF) operation. Operation of this relay provides direct input to generator protection schemes and resulted in the generator trip. To determine correct operation of the zone 1 (40G KLF) relay it was bench tested under conditions designed to duplicate the trip conditions. Normal single phase testing in accordance with vendor manual and approved procedures did not initially detect the failure mode. Using state of the art three-phase testing methods, the following was revealed:

. The malfunction caused the impedance unit to "pick up" at 1.1 amps. With the generator at 400 MW, the 40G KLF relay was exposed to 1.37 amps. Thus, the impedance unit "picked up".

. When the leading power factor reached 120 MVAR, the directional unit "picked up" as designed.

. The "picking up" of the impedance unit and the directional unit fulfilled the conditions sufficient for the trip of the generator.

Further evaluation of the 40G KLF relay revealed , two internal connections with broken ring lugs. These broken connections caused the impedance unit to operate incorrectly and thus caused the trip. The

broken ring lugs were replaced and the 40G KLF relay was retested using the three phase test method and found to meet all acceptance criteria. The zone 2 (40G2 KLF) relay was removed and bench tested. This relay, when tested using the three phase test method, was found to meet all acceptance criteria. Both relays (40G and 40G2 KLF) were returned to service.

A review of previously submitted LERs revealed no additional scrams due to the loss of field relay operation.

TEXT PAGE 3 OF 3

CORRECTIVE ACTION

The 40G KLF relay was reworked and returned to service after testing. GSU is revising maintenance procedures to include three phase testing methods for Westinghouse KLF relays. In addition, GSU is recommending that Westinghouse upgrade the vendor manual to include three phase testing methods. Plant procedures have been revised to include a means for operations personnel to determine the MVAR level at which the directional element in the 40G KLF relay is picked up when operating with a leading power factor. This was done to clearly identify areas of operation which preclude the directional unit from "picking up".

SAFETY ASSESSMENT

There was no impact on the safe operation of the plant or to the health or safety of the public as a result of this event since the reactor scram placed the unit in a safe shutdown condition and all safety systems, functioned as designed.

NOTE: Energy Industry Identification System Codes are identified in the text as (*XX*).

ATTACHMENT 1 TO 9004230336 PAGE 1 OF 1

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE 220 ST. FRANCISVILLE, LOUISVILLE
70778

AREA CODE 504 635-6094 346-8651

April 16, 1990
RBG-32709
File Nos. G9.5, G9.25.1.3

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:
River Bend Station - Unit 1
Docket No. 50-458

Please find enclosed Licensee Event Report No. 90-008 for River Bend Station - Unit 1. This report is being submitted pursuant to 10CFR50.73.

Sincerely,

W. H. Odell
Manager-River Bend Oversight
River Bend Nuclear Group

TFP/PDG /RGW/DCH/pg

cc: U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

NRC Resident Inspector
P.O. Box 1051
St. Francisville, LA 70775

INPO Records Center
1100 Circle 75 Parkway
Atlanta, GA 30339-3064

*** END OF DOCUMENT ***
